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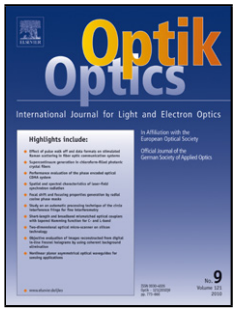


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# Automatic classification of cast iron grades using support vector machine

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**Abstract:**

In this study, classification of three grades of cast iron viz., gray, malleable and white, based on their texture is attempted, using Haralick features extracted from gray level co-occurrence matrix (GLCM) and histogram features extracted from local binary pattern (LBP). The features were extracted from three hundred images stored in a database and are utilized to train and test the support vector machine (SVM), to classify microstructures. The experimental results show that LBP based feature extraction achieves high accuracy when compared to GLCM based features in classifying cast iron grades.

**Key words**: Cast iron, Gray level co-occurrence matrix, Local binary pattern, Support vector machine, Confusion matrix.

## 1 Introduction

Cast iron is broadly used as the base structures of manufacturing machines, rollers, valves, pump bodies, mechanical gears and in automobile, structural, decorative sectors, owing to its higher durability, ability to cast variety of shapes and is relatively inexpensive [1]. The main families of cast irons viz., malleable, gray and white cast iron are defined by the

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